Optimal Monetary Policy in Production Networks
La'O and Tahbaz-Salehi

Discussion by Şebnem Kalemli-Özcan
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21st BIS Annual Conference—Central Banking after the Pandemic: Challenges Ahead

What does the paper do?

- Optimal monetary policy in a multi-sector economy with full input-output network.
- Under nominal rigidities, monetary policy cannot implement the first-best allocation.
- Welfare maximizing-optimal policy should stabilize a price index with higher weights on industries that are:
  - Larger
  - Stickier
  - Connected to less sticky suppliers
  - Connected to more sticky customers.
- In the absence of markup shocks, this second-best policy delivers "divine coincidence":
  $\Rightarrow$ price stabilization simultaneously eliminates inflation and the output gap.

Critical Insight: Importance of nominal rigidities in production networks

- In a **multi-sector economy with input-output linkages**, the intuition of new-keynesian one sector model with identical firms fail.
  - First-best: Flexible relative prices move with relative productivities.
  - To ensure this in a multi-sector economy with sticky prices, the monetary authority must target price stability in a given sector $\Rightarrow$ not possible in multi-sector economy.

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  - To ensure this in a multi-sector economy with sticky prices, the monetary authority must target price stability in a given sector $\Rightarrow$ not possible in multi-sector economy.
- This does not mean monetary policy should be unresponsive to sector-level productivity shocks!
- Calibration to US: Second-best optimal policy delivers only a welfare loss equivalent to a 0.65% of quarterly consumption relative to the unattainable equilibrium.
- Price "index" stabilization is best: Only 0.02 pp loss relative to output stabilization.

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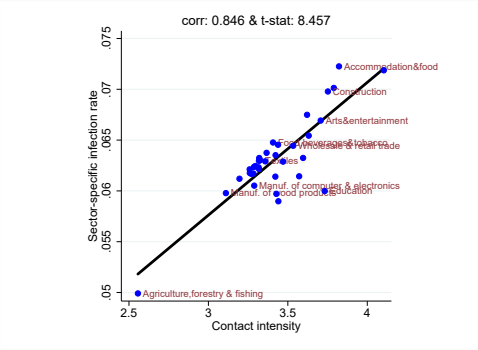
   ⇒ How much the quantitative results change with elasticities < 1?

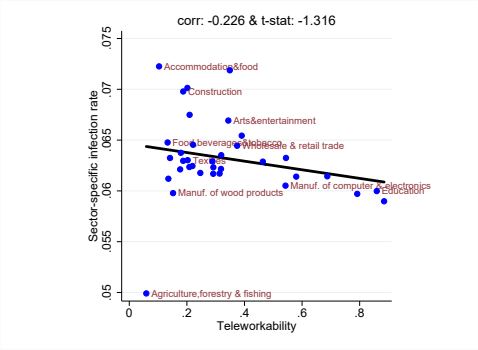
Uneven Sector Shocks in Global I-O Networks: Labor supply and Goods demand

Sectoral Pandemic

(a) Contact Intensive Sectors

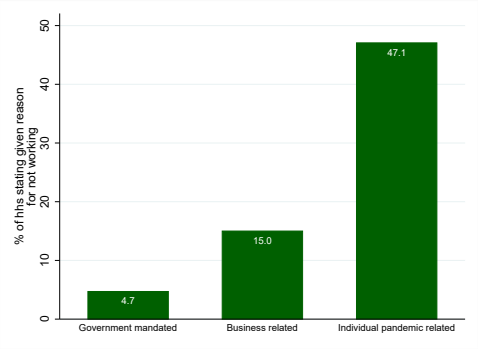


(b) Teleworkable Sectors

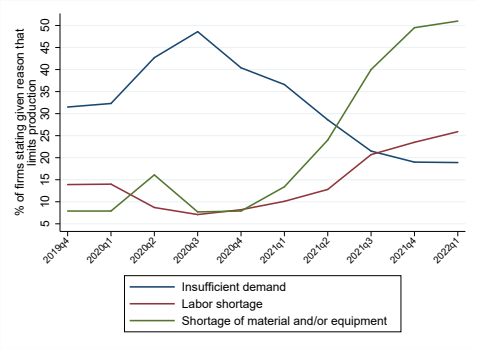


Demand and Supply Side Reasons for Limited Production

(a) Labor Shortage: US Census

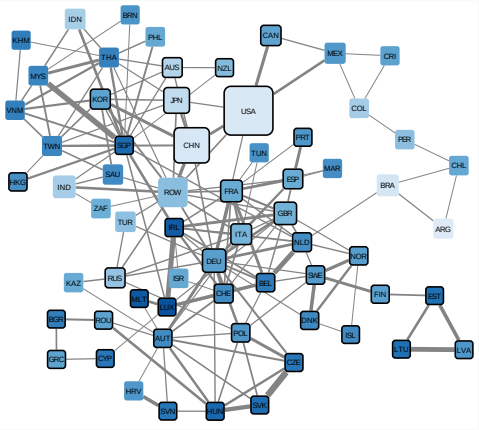


(b) Material and Labor Shortage: EU Commission

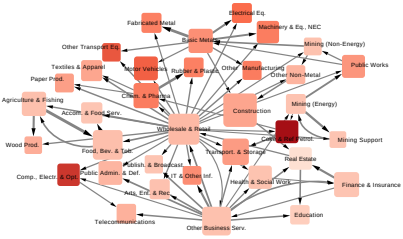


Global Trade and Production Network: OECD ICIO Tables

(a) Countries



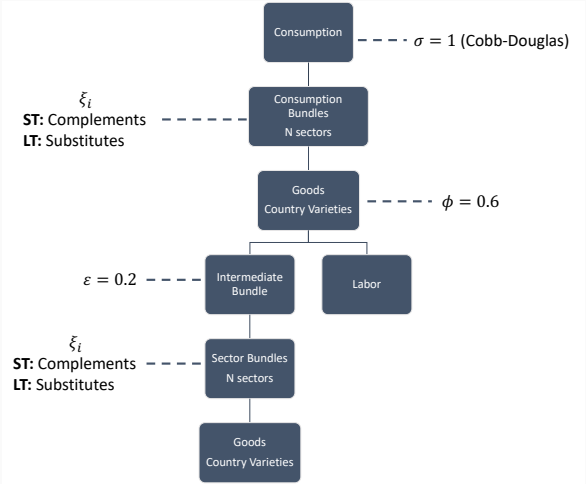
(b) Industries



35 industries in 65 countries, Cakmakli, Demiralp, Kalemli-Ozcan, Yesiltas, Yildirim, 2022

Amplification via non-unitary Elasticities

Elasticities

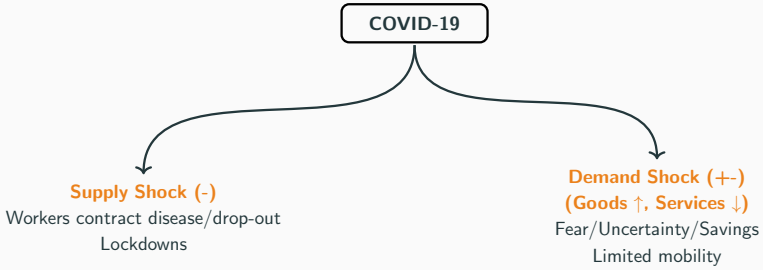


- Barrot and Sauvagnat (2016): Cobb-Douglas production breaks down in the SR (difficult to substitute among suppliers of same inputs).
- ε and ϕ: Baqaee and Farhi (2022) Atalay (2017); Boehm et al. (2019, 2020)
- $\varepsilon = 0.2$—steel and plastic, $\phi = 0.6$—labor and inputs, $\xi_i = 0.2 - 1.5$—trade

Nominal and real GDP losses vary an order of magnitude with elasticities < 1

Why does this matter for inflation and monetary policy?

Supply-Demand Imbalances ↑ with the Stimulative Policy on a Global Scale



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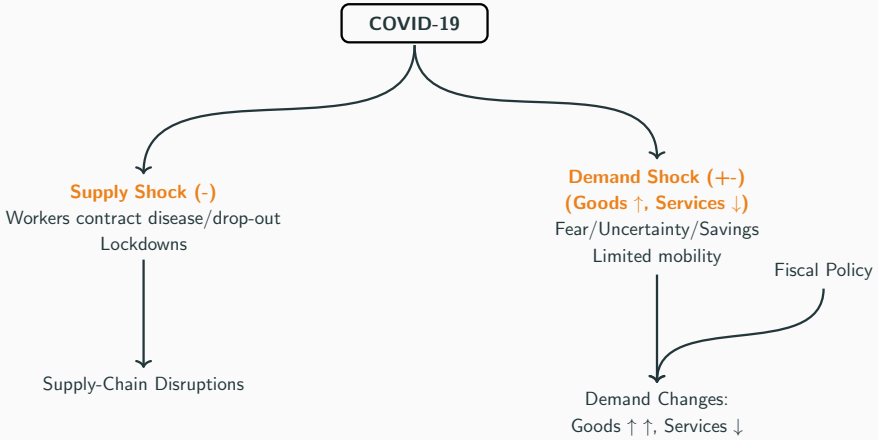

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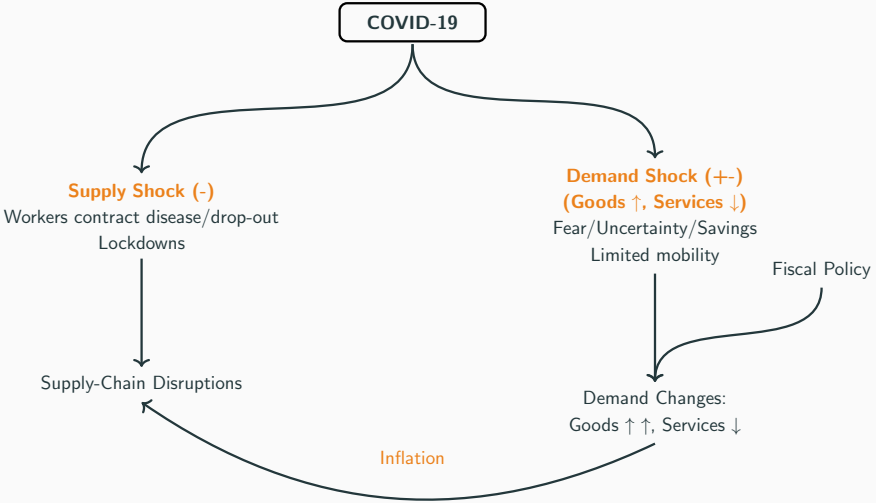

Inflation and monetary policy w/asymmetric shocks and production networks

Theory: **La'O and Tahbaz-Salehi (2022), Baqaee and Farhi (2022), Guerrieri et al. (2021)**

- With asymmetric shocks, optimal monetary policy is second-best, targets relative prices–certain sectors.

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- Focus on period 2019Q4-2021Q4: captures both collapse and recovery
- Allow three types of shocks
  1. Aggregate demand $\Longrightarrow$ Matched Observed Inflation
  2. Sectoral demand $\Longrightarrow$ Sectoral Consumption
  3. Sectoral supply $\Longrightarrow$ Sectoral Total Hours Worked
- Key Idea:

$$\text{Inflation} \approx \text{Aggregate Demand Shocks} - \underbrace{\text{Weighted Observed Employment Changes}}_{\substack{\text{Determined by Sectoral Demand, Supply,} \\ \text{and Aggregate Shocks}}}$$

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$\Rightarrow$ Supply chain bottlenecks: $\approx 1/2$ for Euro Area and $\approx 1/3$ for US

$\Rightarrow$ Foreign supply shocks accounted for $\approx 2/3$ of observed Euro Area inflation

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- How much the normative conclusions change with sector specific demand and supply shocks?
- How would quantitative results change with complementarities, where all elasticities are < 1?
  - Losses due to across-industry misallocation are likely to be more important.
  - Can the result be tilted towards targeting more stickier industries, where size will matter less? or both matter more?

Target more services, less energy still hold with complementarities for open economies?